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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/071,980	02/06/2002	Andrew L. Norrell	PA1634US	1577

7590 04/10/2006

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EXAMINER	
TORRES, JUAN A	

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 04/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/071,980	NORRELL ET AL.	
	Examiner	Art Unit	
	Juan A. Torres	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *37-49* is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3-20-2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/20/2006 has been entered.

Response to Arguments

Regarding claim 36:

Applicant's arguments with respect to claim 36 have been considered but are moot in view of the new ground(s) of rejection.

Regarding claims 1-14 and 24-25:

Applicant's arguments filed 03/20/2006 have been fully considered but they are not persuasive.

The Applicant contends, "Neither Tambe nor Hurst teach or suggest "a central office controller/power supply for providing a control signal and power. . ." and "a loop extender . . . for receiving the control signal and power. . . for providing the control signal and power to the plurality of loop extenders." See Claim 1. The power source 204 in Hurst only powers the transformers 200 and 202. The power source 204 does not provide any control signals. The processor 212 and signal source 206 provide control signals to the switches 208 and 210. The processor 212 and signal source 206

do not provide any control signals to any repeaters." Neither Tambe nor Hurst teach or suggest "broadcasting the control signals via the loop extender communications/power supply to the plurality of loop extenders." See Claim 24. The control signals are broadcasted directly from the central office to the repeaters using "1 pair to carry control information". See (00501 in Tambe. The power source 204 in Hurst only powers the transformers 200 and 202. The power source 204 does not provide any control signals. The processor 212 and signal source 206 provide control signals to the switches 208 and 210. The processor 212 and signal source 206 do not provide any control signals to any repeaters." Applicant therefore submits that the rejection based the Tambe and Hurst reference is improper and should be withdrawn"

The Examiner disagrees and asserts, that, Hurst discloses "a central office controller/power supply for providing a control signal and power" and "a loop extender . . . for receiving the control signal and power. . . for providing the control signal and power to the plurality of loop extenders.", 204 will supply the power and 212 is the controller. Hurst discloses "As mentioned above, one way to take a repeater 28 out of the LOOP STATE is to send the repeater a stop loop signal from the central office 22. In the illustrated embodiment (see FIG. 5E), the stop loop signal has the following value, which is repeated for at least five seconds: 11100 Thus, the testable repeaters 28 of the present invention facilitate remote locational sectionalization by transmitting a start loop signal from the first central office 22 to the mid-span repeater (e.g., repeater 28.sub.3, in the manner afore described) in an attempt to loop the mid-span repeater 28.sub.3. If the mid-span repeater 28.sub.3 can be successfully looped (as described

above), the fault is further down span from the first central office 22. Otherwise, the fault is upstream (e.g., toward) the first central office 22. In either case, the next step is to attempt to loop another repeater which is half way from mid-span in the direction of the fault. This is continued until a section of the network 20 can be identified where a repeater 28 on the end closest to the central office can be looped and the next repeater 28 cannot. Once this section has been identified, a repair technician can be dispatched. When the simplex path is cut, and if the cut span is single ended powered, the repeater 28 will automatically implement (via switch 64' or 66') a simplex loop to restore power to the repeaters between it and the central office. Assume, for example, that a cut occurred on line segment 30.sub.4 upstream from repeater 28.sub.3. When sent the "start loop" code of FIG. 5F, the pattern of FIG. 5G will be returned to the first central office 22. Thus, examination of the returned fault location pattern at the central office 22 will directly indicate the particular repeater (e.g., repeater 28.sub.3). Normal operation is automatically resumed when the simplex path is restored. When a dribbling or intermittent failure is suspect, the central office (e.g., central office 22) can query each repeater 28 to isolate the first occurrence of a dribbling failure. This information is obtained by successfully looping each repeater 28 in the manner previously described. When looped, each repeater 28 transmits the DSM signal with the information shown in Table 1 (see also FIG. 7). This information is provided for both sides of the repeater 28. The test-related signals described above (e.g., the start loop signal and the stop loop signal) can be applied to the network 20 in a number of ways. At a conventional central office, the signals can be transmitted up the network 20 using common jacking

techniques. In the more sophisticated central office having the office bay repeater (OBR) shown in FIG. 4, on the other hand, the test-related signals are applied to the processor 212 via data entry means such as a keyboard. Upon receipt of the test-related signals, the processor 212 loads the test-related signal into a register such as signal source 206, and further controls the switches 208 and 210 so that the test-related signal is transmitted up the network for the requisite period of time. Thus, the present invention provides an automatic and position dependent addressing scheme for repeaters 28 included in a network 20. Automatic and position dependent addressing facilitates reconfiguration of the network to include more or less repeaters, without having to change circuitry or address switches at each repeater. Moreover, the automatic and position dependent addressing method and apparatus of the current invention eliminates potential for improper address setup at installation. Importantly, the invention also facilitate the rapid and direct sectionalization of faults and difficulties, including both hard and dribbling span failures. As additional benefits, the repeaters of the present invention provide diagnostic information, including diagnostic information related to driver opens and shorts; powering status; signal level (gain); CRC errors; and BPV errors" (emphasis added).

For these reasons and the reason stated en the previous Office action, the rejection of claims 1-14 and 24-25 are maintained.

Regarding claims 37-49:

Applicant's arguments, see Applicant Arguments/Remarks Made in an Amendment, filed 03/20/2006, with respect to claims 37-49 have been fully considered and are persuasive. The rejection of claims 37-49 has been withdrawn.

Regarding claims 15-23 and 26-35:

Applicant's arguments filed 03/20/2006 have been fully considered but they are not persuasive.

The Applicant contends, "The arguments set forth above regarding the other claims are equally applicable here. Thus, Applicant submits that claims 1-14 and 24-25 recite novel subject matter which distinguishes over any possible combination of Tambe, Hurst and Shenoi".

The Examiner disagrees and asserts, that, because the rejections of claim 1-14 and 24 are maintained, the rejections of claims 15-23 and 26-25 are also maintained.

For these reasons and the reason stated en the previous Office action, the rejection of claims 15-23 and 26-35 are maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-14 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tambe (US 20020113649 A1) in view of Hurst (US 5422929) (with Surprenant (US 4277655 A) to indicate a well-known motivation).

As per claim 1, Tambe discloses a plurality of loop extenders coupled to a plurality of local loops for amplifying upstream and downstream DSL signals transmitted over a first local loop and a second local loop selected from the plurality of local loops (figures 4 and 5 page 4 paragraphs [0043] to [0044]); a central office controller/power supply coupled to a first local loop of the plurality of local loops and coupled to a second local loop of the plurality of local loops, the central office controller/power supply for providing a control signal and power supplying a supply voltage between to the first local loop and the second local loop (pages 4-5 paragraph [0049] to [0052]); and a loop extender communications/power supply coupled to the central office controller/power supply via the first local loop and the second local loop for receiving the control signal and power via the first local loop and the second local loop, and coupled to the plurality of loop extenders for providing the control signal and power to the plurality of loop extenders (figures 4 and 5 pages 4-5 paragraphs [0043] to [0052]). Tambe doesn't specifically disclose that the power is supply by loading supply voltage between a first local loop and a second local loop having a first node couple to the first loop and a second node couple to the second loop. Hurst discloses that the power is supply by loading supply voltage between a first local loop and a second local loop having a first node couple to the first loop and a second node couple to the second loop (figure 4 column 8 line 61 to column 9 line 8). Tambe and Hurst are analogous art because they

are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DSL repeater disclosed by Tambe the power supply disclosed by Hurst. The suggestion/motivation for doing so would have been to use a very well known way to supply power from the CO to the repeater and also to provide minimum operating power loss with maximum power transfer between the repeater circuit and subscriber loop while maintaining adequate transhybrid loss between the two directions of transmission and matching input impedance (this second motivation is well known and can be found in Surprenant US 4277655 A abstract).

As per claim 2, Tambe and Hurst disclose claim 1. Hurst also discloses that the central office controller/power supply is coupled to the first local loop via a first transformer and coupled to the second local loop via a second transformer (figure 2 column 4 lines 53-65). Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DSL repeater disclosed by Tambe the power supply disclosed by Hurst. The suggestion/motivation for doing so would have been to use a very well known way to supply power from the CO to the repeater and also to provide minimum operating power loss with maximum power transfer between the repeater circuit and subscriber loop while maintaining adequate transhybrid loss between the two directions of transmission and matching input impedance (this second motivation is well known and can be found in Surprenant US 4277655 A abstract).

As per claim 3, Tambe and Hurst disclose claim 2. Hurst also discloses that the central office controller/power supply includes a central office power supply, a positive node of the central office power supply being inductively coupled to a center tap of the first transformer and a negative node of the central office power supply being inductively coupled to a center tap of the second transformer (figure 2 and figure 4 column 8 line 61 to column 9 line 8). Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DSL repeater disclosed by Tambe the power supply disclosed by Hurst. The suggestion/motivation for doing so would have been to use a very well known way to supply power from the CO to the repeater and also to provide minimum operating power loss with maximum power transfer between the repeater circuit and subscriber loop while maintaining adequate transhybrid loss between the two directions of transmission and matching input impedance (this second motivation is well known and can be found in Surprenant US 4277655 A abstract).

As per claim 4, Tambe and Hurst disclose claim 1. Hurst also discloses that the loop extender communications/power supply is coupled to the first local loop via a third transformer and coupled to the second local loop via a fourth transformer (figure 2 column 4 lines 53-65). Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DSL repeater disclosed by Tambe the power supply disclosed by Hurst. The suggestion/motivation for doing so would

have been to use a very well known way to supply power from the CO to the repeater and also to provide minimum operating power loss with maximum power transfer between the repeater circuit and subscriber loop while maintaining adequate transhybrid loss between the two directions of transmission and matching input impedance (this second motivation is well known and can be found in Surprenant US 4277655 A abstract).

As per claim 5, Tambe and Hurst disclose claim 4. Hurst also discloses that the loop extender communications/power supply includes a loop extender power supply, a positive node of the loop extender power supply being inductively coupled to a center tap of the third transformer and a negative node of the loop extender power supply being inductively coupled to a center tap of the fourth transformer (figure 2 and figure 4 column 8 line 61 to column 9 line 8). Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DSL repeater disclosed by Tambe the power supply disclosed by Hurst. The suggestion/motivation for doing so would have been to use a very well known way to supply power from the CO to the repeater and also to provide minimum operating power loss with maximum power transfer between the repeater circuit and subscriber loop while maintaining adequate transhybrid loss between the two directions of transmission and matching input impedance (this second motivation is well known and can be found in Surprenant US 4277655 A abstract).

As per claim 6, Tambe and Hurst disclose claim 5. Tambe also discloses that the loop extender power supply is coupled to the plurality of loop extenders for providing power to the plurality of loop extenders (figures 4 and 5 pages 4-5 paragraphs [0043] to [0052]).

As per claim 7, Tambe and Hurst disclose claim 1. Tambe also discloses that the central office controller/power supply includes a first modem for communication with the plurality of loop extenders, a processor coupled to the first modem, and loop extender management software executable by the processor for generating control signals; and the loop extender communications/power supply includes a second modem for communication with the central office controller/power supply (figures 4 and 5 pages 4-5 paragraphs [0043] to [0052]).

As per claim 8, Tambe and Hurst discloses claim 7. Hurst also discloses that the first modem is coupled to the first local loop via a first transformer and coupled to the second local loop via a second transformer, and the second modem is coupled to the first local loop via a third transformer and coupled to the second local loop via a fourth transformer (figure 2 column 4 lines 53-65). Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DSL repeater disclosed by Tambe the power supply disclosed by Hurst. The suggestion/motivation for doing so would have been to use a very well known way to supply power from the CO to the repeater and also to provide minimum operating power loss with maximum power transfer between the repeater circuit and subscriber loop

while maintaining adequate transhybrid loss between the two directions of transmission and matching input impedance (this second motivation is well known and can be found in Surprenant US 4277655 A abstract).

As per claim 9, Tambe and Hurst disclose claim 8. Tambe also discloses that the first modem is coupled to a center tap of the first transformer via a first capacitor and coupled to a center tap of the second transformer via a second capacitor, and the second modem is coupled to a center tap of the third transformer via a third capacitor and coupled to a center tap of the fourth transformer via a fourth capacitor (figure 6 pages 5-6 paragraphs [0059] to [0062]).

As per claim 10, Tambe and Hurst disclose claim 9. Hurst also discloses a transformer couples the first capacitor and the second capacitor to the first modem, and a transformer couples the third capacitor and the fourth capacitor to the second modem. (figure 2 column 4 lines 53-65). Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DSL repeater disclosed by Tambe the power supply disclosed by Hurst. The suggestion/motivation for doing so would have been to use a very well known way to supply power from the CO to the repeater and also to provide minimum operating power loss with maximum power transfer between the repeater circuit and subscriber loop while maintaining adequate transhybrid loss between the two directions of transmission and matching input impedance (this second motivation is well known and can be found in Surprenant US 4277655 A abstract).

As per claim 11, Tambe and Hurst disclose claim 10. Tambe also discloses that the first modem and the second modem communicate in a voice-frequency band (page 1 paragraph [0008]).

As per claim 12, Tambe and Hurst disclose claim 8. Tambe also discloses that the processor sends the control signals to the first modem for transmission over the first local loop and the second local loop (figures 4 and 5 pages 4-5 paragraphs [0043] to [0052]).

As per claim 13, Tambe and Hurst disclose claim 12. Tambe also discloses that the second modem receives the control signals and broadcasts the received control signals to the plurality of loop extenders via the plurality of local loops (figures 4 and 5 pages 4-5 paragraphs [0043] to [0052]).

As per claim 14, Tambe and Hurst disclose claim 13. Tambe also discloses that each loop extender of the plurality of loop extenders includes a POTS loading coils coupled to a local loop of the plurality of local loops (figures 4 and 5 pages 4-5 paragraphs [0043] to [0052]); DSL amplification circuitry coupled to the local loop via bypass switches (figures 4 and 5 pages 4-5 paragraphs [0043] to [0052]); an analog multiplexer/analog-to-digital converter (AMADC) coupled to the DSL amplification circuitry via diagnostic lines and control lines for sampling DSL signals via the diagnostic lines and controlling the DSL amplification circuitry via the control lines (figures 2 and 3 pages 3-4 paragraphs [0036] to [0042]); and a diagnostic/control processor (DCP) coupled to the local loop and the AMADC for processing the control

signals received via the local loop and processing the sampled DSL signals from the AMADC (figures 4 and 5 pages 4-5 paragraphs [0043] to [0052]).

As per claim 24, Tambe discloses amplifying upstream and downstream DSL signals transmitted over a first local loop and a second local loop selected from a plurality of local loops via a plurality of loop extenders coupled to the plurality of local loops (figures 4 and 5 page 4 paragraphs [0043] to [0044]); providing power to a loop extender communications/power supply via a first local loop of the plurality of local loops and via a second local loop of the plurality of local loops for providing power to the plurality of loop extenders (pages 4-5 paragraph [0049] to [0052]); sending control signals to a loop extender communications/power supply via the first local loop and via the second local loop, receiving the control signals, and broadcasting the control signals to the plurality of loop extenders (figures 4 and 5 pages 4-5 paragraphs [0043] to [0052]). Tambe doesn't specifically disclose that the power is supply by loading supply voltage between a first local loop and a second local loop having a first node couple to the first loop and a second node couple to the second loop, and that the broadcasting the control signals to the plurality of loop extenders is via the loop extender communications power supply. Hurst discloses that the power is supply by loading supply voltage between a first local loop and a second local loop having a first node couple to the first loop and a second node couple to the second loop (figure 4 column 8 line 61 to column 9 line 8) and that the broadcasting the control signals to the plurality of loop extenders is via the loop extender communications power supply (column 14 line 1 to column 15 line 22). Tambe and Hurst are analogous art because they are from the

same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DSL repeater disclosed by Tambe the power supply disclosed by Hurst. The suggestion/motivation for doing so would have been to use a very well known way to supply power from the CO to the repeater and also to provide minimum operating power loss with maximum power transfer between the repeater circuit and subscriber loop while maintaining adequate transhybrid loss between the two directions of transmission and matching input impedance (this second motivation is well known and can be found in Surprenant US 4277655 A abstract).

As per claim 25, Tambe and Hurst disclose claim 24. Tambe also discloses that the control signals are broadcast in a voice-frequency band (page 1 paragraph [0008]).

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shenoi (US 6507606) and further in view of Hurst (US 5422929) (with Surprenant (US 4277655 A) to indicate a well-known motivation). Shenoi discloses a system for improving transmission of DSL signals, the system comprising means for transmitting DSL signals (column 1 lines 48-60 and column 1 line 61 to column 2 line 11); means for amplifying the transmitted DSL signals (figure 4 column 7 line 64 to column 8 line 14); first means for providing power to the means for amplifying (column 8 lines 51-67); second means for providing power via the means for transmitting DSL signals to the first means for providing power (column 7 lines 57-67); means for controlling the means for amplifying to improve performance of the means for amplifying (column 8 lines 57-67); means for broadcasting to the means for controlling (column 1 lines 48-60 and column 1 line 61 to

column 2 line 11); means for generating control signals (column 8 lines 57-67 and column 17 line 61 to column 18 line 3); means for sending the control signals via the means for transmitting DSL signals to the means for broadcasting (column 1 lines 48-60 and column 1 line 61 to column 2 line 11). Shenoi doesn't disclose means for sending the control signals via the first means to the means for broadcasting. Hurst discloses means for sending the control signals via the first means to the means for broadcasting (figure 2 column 8 line 61 to column 9 line 9; and column 14 line 12 to column 156 line 22). Shenoi and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the lop extender disclosed by Shenoi with the coupled transformers disclosed by Hurst. The suggestion/motivation for doing so would have been to use a very well known way to supply power from the CO to the repeater and also to provide minimum operating power loss with maximum power transfer between the repeater circuit and subscriber loop while maintaining adequate transhybrid loss between the two directions of transmission and matching input impedance (this second motivation is well known and can be found in Surprenant US 4277655 A abstract).

Claims 15-23 and 26-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tambe and Hurst as applied to claims 14 and 24 above, and further in view of Shenoi (US 6507606).

As per claim 15, Tambe and Hurst disclose claim 14. Tambe and Hurst don't disclose that the DCP processes the sampled DSL signals to compute average power.

Shenoi inherently discloses that the DCP processes the sampled DSL signal data to compute average power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the average power is inherently in the calculation of the spectral density and power control). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 16, Tambe and Hurst disclose claim 14. Tambe and Hurst don't disclose that the DCP processes the sampled DSL signal data to compute peak power. Shenoi inherently discloses that the DCP processes the sampled DSL signal data to compute peak power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the peak power is inherently in the calculation of the spectral density and power control). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 17, Tambe and Hurst disclose claim 14. Tambe and Hurst don't disclose that the DCP processes the sampled DSL signal data to compute root-mean-

square power. Shenoi inherently discloses the DCP processes the sampled DSL signal data to compute root-mean-square power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the root-mean-square (rms) power is inherently in the calculation of the spectral density and power control). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 18, Tambe and Hurst disclose claim 14. Tambe and Hurst don't disclose that the DCP processes the sampled DSL signal data to compute power spectral density. Shenoi discloses the DCP processes the sampled DSL signal data to compute power spectral density (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 19, Tambe and Hurst disclose claim 14. Tambe and Hurst don't disclose that a bypass relay for coupling the DCP to the bypass switches. Shenoi inherently discloses a bypass relay for coupling the DCP to the bypass switches

(column 8 line 57 to column 9 line 35). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 20, Shenoi, Tambe and Hurst disclose claim 19. Shenoi inherently discloses the DCP upon receiving control signals from the central office controller, uncouples the amplification circuitry from the local loop by activating a deactivated bypass relay (column 8 line 57 to column 9 line 35). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 21, Shenoi, Tambe and Hurst disclose claim 19. Shenoi inherently discloses the DCP upon receiving control signals from the central office controller, uncouples the amplification circuitry from the local loop by activating a deactivated bypass relay (column 8 line 57 to column 9 line 35). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by

Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 22, Shenoi, Tambe and Hurst disclose claim 19. Tambe and Hurst don't disclose that that processing the control signals to select the DSL amplification circuitry for improving performance of the DSL amplification circuitry. Shenoi discloses that processing the control signals to select the DSL amplification circuitry for improving performance of the DSL amplification circuitry (column 8 line 57 to column 9 line 35). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 23, Shenoi, Tambe and Hurst disclose claim 19. Tambe and Hurst don't disclose that the sampled DSL signals to select the DSL amplification circuitry for improving performance of the DSL amplification circuitry. Shenoi discloses that processing the sampled DSL signals to select the DSL amplification circuitry for improving performance of the DSL amplification circuitry (column 8 line 57 to column 9 line 35). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 26, Tambe and Hurst disclose claim 24. Tambe and Hurst don't specifically disclose that each loop extender, upon receiving a broadcast control signal, samples DSL signals. Shenoi discloses that each loop extender, upon receiving a broadcast control signal, samples DSL signals (figure 5 column 9 line 46 to column 10 line 22). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 27, Tambe, Hurst and Shenoi disclose claim 26. Shenoi inherently discloses that each loop extender processes the sampled DSL signals to compute average power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the average power is inherently in the calculation of the spectral density and power control). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 28, Tambe, Hurst and Shenoi disclose claim 26. Shenoi inherently discloses that each loop extender processes the sampled DSL signals to compute peak power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The

calculation of the peak power is inherently in the calculation of the spectral density and power control). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 29, Tambe, Hurst and Shenoi disclose claim 26. Shenoi inherently discloses that each loop extender processes the sampled DSL signals to compute root-mean-square power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the root-mean-square (rms) power is inherently in the calculation of the spectral density and power control). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 30, Tambe, Hurst and Shenoi disclose claim 26. Shenoi discloses that each loop extender processes the sampled DSL signals to compute power spectral density (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in

the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 31, Tambe and Hurst disclose claim 24. Tambe and Hurst don't specifically disclose the step of amplifying upstream and downstream DSL signals via DSL amplification circuitry. Shenoi discloses the step of amplifying upstream and downstream DSL signals via DSL amplification circuitry (figure 4 column 7 line 64 to column 8 line 14). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 32, Tambe, Hurst and Shenoi disclose claim 31. Shenoi inherently discloses that each loop extender, upon receiving a broadcast control signal, uncouples the DSL amplification circuitry from the local loop (column 8 line 57 to column 9 line 35). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 33, Tambe, Hurst and Shenoi disclose claim 31. Shenoi inherently discloses that each loop extender, upon receiving a broadcast control signal, couples the DSL amplification circuitry to the local loop (column 8 line 57 to column 9 line 35). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 34, Tambe and Hurst disclose claim 24. Tambe and Hurst don't specifically disclose that where each loop extender, upon receiving a broadcast control signal, selects switch states of the DSL amplification circuitry according to the broadcast control signal for improving performance of the DSL amplification circuitry. Shenoi inherently discloses that where each loop extender, upon receiving a broadcast control signal, selects switch states of the DSL amplification circuitry according to the broadcast control signal for improving performance of the DSL amplification circuitry (column 8 line 57 to column 9 line 35). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

As per claim 35, Tambe and Hurst disclose claim 24. Tambe and Hurst don't specifically disclose that each loop extender, upon receiving a broadcast control signal, samples the DSL signals and selects switch states of the DSL amplification circuitry according to the sampled DSL signals for improving performance of the DSL amplification circuitry. Shenoi inherently discloses that each loop extender, upon receiving a broadcast control signal, samples the DSL signals and selects switch states of the DSL amplification circuitry according to the sampled DSL signals for improving performance of the DSL amplification circuitry (column 8 line 57 to column 9 line 35). Shenoi, Tambe and Hurst are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to supplement the loop extender disclosed by Tambe with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to adapt the amplification in both transmission directions (Shenoi abstract).

Allowable Subject Matter

Claims 37-49 are allowed.

The following is an examiner's statement of reasons for allowance: claims 37-49 are allowed because the references cited fail to teach, as applicant has, a loop extender communications/power supply coupling the first local loop and the second local loop to the plurality of loop extenders for providing power and broadcasting the control signals to the plurality of loop extenders, the loop extender communications/power supply including a second modem for communication with the plurality of loop extenders; and a central office controller/power supply coupled to the first local loop via a first transformer

and coupled to the second local loop via a second transformer for providing power to the loop extender communications/power supply, generating the control signals, and sending the control signals to the loop extender communications/power supply, the central office controller/power supply including a first modem for communication with the loop extender communications/power supply, a processor coupled to the first modem, and loop extender management software executable by the processor for generating the control signals, as the applicant has claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is (571) 272-3119. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Juan Alberto Torres
3-25-2006

3/20/06

TEMESGHEN GHEBRETINSAE
PRIMARY EXAMINER

NG